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(54) Beverage with good colour stability

(57) A beverage comprises an aqueous medium containing up to 5 ppm of transition metal ions, for example demineralised water and demineralised glucose syrup, together with 0.005 to 0.5% by weight of ascorbic acid, and sufficient naturally occurring carotenoid pigment for example crocin to provide from 1 to 250 ppm of active colouring ingredient in the beverage.

The beverage has a reduced tendency to colour fade during its normal shelf life.

GB 2 190 822 A

SPECIFICATION

Beverage compositions

The present invention relates to a beverage composition, in particular to soft drinks having good colour stability.

Natural colouring agents, particularly carotenoid colouring agents, are now becoming more preferred to synthetic agents for use within the food and drink industry due largely to greater health conciousness among the general public. It is known to use carotenoid colouring agents such as crocin, or plant extracts containing crocin in various foodstuffs such as candies, jellies and jams, biscuits, cakes, frozen deserts, snack foods, sea foods, flavoured milks and vegetables. The use of crocin in soft drinks has hitherto been restricted since the colour of crocin fades during the shelf life of the drink.

It has now been discovered that by using crocin in a beverage containing ascorbic acid in an aqueous medium substantially free of transition metal ions the colour fade can be severely reduced throughout the shelf life, thereby giving the beverage greater consumer appeal.

According to the present invention there is provided a beverage which comprises an aqueous medium containing up to 5ppm of transition metal ions, but preferably less than 0.1ppm, .005 to .5% by weight of ascorbic acid and a sufficient quantity of naturally occurring carotenoid pigment to provide from 1 to 250 ppm of active colouring ingredient in the beverage.

While not wishing to be bound by theory, it is believed that the transition metal ions, particularly copper or iron, catalyse the oxidation of ascorbic acid and that this produces, among other reaction products, hydrogen peroxide and transient perhydroxyl radicals which can themselves react to generate free hydroxy radicals. These radicals are powerful oxidants of conjugated polyene systems which occur in carotenoids, and this causes disruption of the polyene chain and hence loss of colour.

Aqueous demineralisation may be achieved by ion-exchange processes or by other methods known to those skilled in the art. Preferably, the demineralised aqueous medium comprises normal tap water which has been subjected to an ion-exchanged process. Soft drinks conventionally include carbohydrate, such as glucose syrup in the aqueous medium, and these and other ingredients should also be free of transition metal ions.

When glucose syrup is used, it is preferably present in an amount of from 10 to 90% by weight. Although demineralised aqueous medium would in practice normally mean a medium free of all ionic species, it should be realised that some ions may be permitted, such as Ca^{2+} ions commonly found in hard water, without effecting the colour fade of the pigment. It is transition metal ions, and in particular iron and copper ions which are common impurities in tap water, which in combination with ascorbic acid cause the colour fade problem, and these should be present at a level below 0.1 ppm.

The beverage of the invention may contain other ingredients conventionally used in the art, such as a fruit base, sugar (granulated or sugar syrup), artificial sweeteners (such as saccharin or aspartame), preservatives, acidulents, vitamins and flavouring agents (natural or synthetic). It has been found particularly useful to include sulphur dioxide, in amounts permitted under current food regulations, which has the benefit of minimising the loss of ascorbic acid from the beverage when the beverage is exposed to the air. Of course, any such ingredients must not increase the total concentration of transition metal ions above the limit stipulated. The beverage is preferably in the form of a squash concentrate, which is dilutable with water when required. The beverage may also be ready to drink or carbonated if desired in accordance with known techniques.

The beverage of the invention may be manufactured by mixing the ingredients, in known manner, at normal temperature and pressure, and pasteurising the mixture before bottling. The demineralisation procedure to remove the metal ions may be carried out on part or the whole of the beverage before bottling.

The invention is now illustrated by the following examples.

Example 1

A carbonated lemon flavoured beverage has the following ingredients:

	% w/v
Demineralised Glucose Syrup (Tunnel Refineries TS 185)	20.3
Citric acid	0.36
Sodium metabisulphite	0.0117
Crocin extract (Overseal Foods Gardenia Colour OF 329)	0.032
Ascorbic acid	0.010
Flavouring as required	
Demineralised Water	q.s.
Carbon dioxide to 2.5 volumes	

Example 2

A concentrated citrus flavoured drink has the following ingredients:

	% w/v
Demineralised Glucose Syrup (Tunnel Refineries TS 185)	82.2
Citric acid	1.46
Sodium benzoate	0.0379
Sodium metabisulphite	0.025
Crocin extract (Pointing Natural Crocin Liquid 78224	0.128
Cochineal (Overseal Foods Cochineal OF 599)	0.030
Ascorbic acid	0.050
Flavouring as required	
Water	q.s.

CLAIMS

1. A beverage which comprises an aqueous medium containing up to 5ppm of transition metal ions, 0.005 to 0.5% by weight of ascorbic acid and a sufficient quantity of naturally occurring carotenoid pigment to provide from 1 to 250 ppm of active colouring ingredient in the beverage.

2. A beverage according to claim 1, in which the amount of transition metal ions is less than 0.1 ppm.

3. A beverage according to claim 1 or 2, in which the pigment comprises crocin.

4. A beverage according to any one of claim 1 to 3, in which the aquous medium comprises demineralised water.

5. A beverage according to any one of claim 1 to 4, which contains demineralised glucose syrup.

6. A beverage according to any one of claims 1 to 5, in the form of a squash concentrate or ready to drink presentation.

7. A beverage substantially as hereinbefore described with reference to Example 1.

8. A beverage substantially as hereinbefore described with reference to Example 2.

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